

# UTILITY PATENT APPLICATION TRANSMITTAL

## (Small Entity)

(Only for new nonprovisional applications under 37 CFR 1.53(b))

Docket No.  
MUR-8410

Total Pages in this Submission

### TO THE ASSISTANT COMMISSIONER FOR PATENTS

Box Patent Application  
Washington, D.C. 20231

Transmitted herewith for filing under 35 U.S.C. 111(a) and 37 C.F.R. 1.53(b) is a new utility patent application for an invention entitled:

CASING CENTRALISER

and invented by:

Ian Alastair Kirk, William Barron, and Alistair Bertram Clark

If a CONTINUATION APPLICATION, check appropriate box and supply the requisite information:

☐ Continuation ☐ Divisional ☒ Continuation-in-part (CIP) of prior application No.: PCT/GB98/00554

Which is a:

☐ Continuation ☐ Divisional ☐ Continuation-in-part (CIP) of prior application No.:

Which is a:

☐ Continuation ☐ Divisional ☐ Continuation-in-part (CIP) of prior application No.:

Enclosed are:

### Application Elements

1. ☒ Filing fee as calculated and transmitted as described below
2. ☒ Specification having twelve (12) pages and including the following:
  - a. ☒ Descriptive Title of the Invention
  - b. ☒ Cross References to Related Applications (if applicable)
  - c. ☐ Statement Regarding Federally-sponsored Research/Development (if applicable)
  - d. ☐ Reference to Microfiche Appendix (if applicable)
  - e. ☒ Background of the Invention
  - f. ☒ Brief Summary of the Invention
  - g. ☒ Brief Description of the Drawings (if drawings filed)
  - h. ☒ Detailed Description
  - i. ☒ Claim(s) as Classified Below
  - j. ☒ Abstract of the Disclosure

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**Application Elements (Continued)**

3. ☒ Drawing(s) *(when necessary as prescribed by 35 USC 113)*  
a. ☐ Formal      b. ☒ Informal      Number of Sheets five (5)
4. ☒ Oath or Declaration  
a. ☐ Newly executed *(original or copy)*      ☒ Unexecuted  
b. ☐ Copy from a prior application (37 CFR 1.63(d)) *(for continuation/divisional application only)*  
c. ☒ With Power of Attorney      ☐ Without Power of Attorney  
d. ☐ DELETION OF INVENTOR(S)  
Signed statement attached deleting inventor(s) named in the prior application,  
see 37 C.F.R. 1.63(d)(2) and 1.33(b).
5. ☐ Incorporation By Reference *(usable if Box 4b is checked)*  
The entire disclosure of the prior application, from which a copy of the oath or declaration is supplied under  
Box 4b, is considered as being part of the disclosure of the accompanying application and is hereby  
incorporated by reference therein.
6. ☐ Computer Program in Microfiche
7. ☐ Genetic Sequence Submission *(if applicable, all must be included)*  
a. ☐ Paper Copy  
b. ☐ Computer Readable Copy  
c. ☐ Statement Verifying Identical Paper and Computer Readable Copy

**Accompanying Application Parts**

8. ☐ Assignment Papers *(cover sheet & documents)*
9. ☐ 37 CFR 3.73(b) Statement *(when there is an assignee)*
10. ☐ English Translation Document *(if applicable)*
11. ☐ Information Disclosure Statement/PTO-1449      ☐ Copies of IDS Citations
12. ☐ Preliminary Amendment
13. ☒ Acknowledgment postcard
14. ☒ Certificate of Mailing  
☐ First Class      ☒ Express Mail *(Specify Label No.):* EJ483055120US

# UTILITY PATENT APPLICATION TRANSMITTAL (Small Entity)

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## Accompanying Application Parts (Continued)

15. Benefit of priority of U.K. Patent No. 9703608.1 filed 21 February 1997 is claimed under 35 USC 119 and 120.

16. ☒ Small Entity Statement(s) - Specify Number of Statements Submitted: one (1)

17. ☒ Additional Enclosures (please identify below):

Copy of International Application Number PCT/GB98/00554; Interntl Filing Date: 23 February 1998.

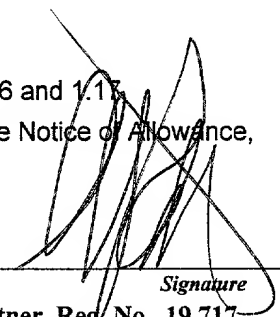
## Fee Calculation and Transmittal

### CLAIMS AS FILED

For	#Filed	#Allowed	#Extra	Rate	Fee
Total Claims	20	- 20 =	0	x \$9.00	\$0.00
Indep. Claims	1	- 3 =	0	x \$39.00	\$0.00
Multiple Dependent Claims (check if applicable) <input type="checkbox"/>					\$0.00
BASIC FEE					\$380.00
OTHER FEE (specify purpose)					\$0.00
TOTAL FILING FEE					\$380.00

- ☒ A check in the amount of \$380.00 to cover the filing fee is enclosed.
- ☒ The Commissioner is hereby authorized to charge and credit Deposit Account No. 18-0350 as described below. A duplicate copy of this sheet is enclosed.
- ☐ Charge the amount of \_\_\_\_\_ as filing fee.
- ☒ Credit any overpayment.
- ☒ Charge any additional filing fees required under 37 C.F.R. 1.16 and 1.17.
- ☐ Charge the issue fee set in 37 C.F.R. 1.18 at the mailing of the Notice of Allowance, pursuant to 37 C.F.R. 1.311(b).

Dated: August 23, 1999

  
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AUG 24 1999 11:07AM

Applicant or Patent: Im Alexander Kirk, William Barron, and Aferdy Barron Clark  
 Serial or Patent No. PCT/GB98/00554  
 Filed or Issued: 23 February 1998  
 For: CASING CENTRALISER

Attorney's Docket No.: MUR-8410

**VERIFIED STATEMENT (DECLARATION) CLAIMING SMALL ENTITY  
 STATUS (37 CFR 1.9(c) and 1.77(c) - SMALL BUSINESS CONCERN)**

I hereby declare that I am

- ☐ the owner of the small business concern identified below;  
☒ an official of the small business concern empowered to act on behalf of the concern identified below;

NAME OF CONCERN Downhole Products PLCADDRESS OF CONCERN Redgates Road, Redgates Park, Portlithgow, Aberdeen AB12 4YA, UNITED KINGDOM

I hereby declare that the above identified small business concern qualifies as a small business concern as defined in 13 CFR 121.3-18, and reproduced in 37 CFR 1.9(c), for purposes of paying reduced fees under Section 41(a) and (b) of Title 35, United States Code, in that the number of employees of the concern, including those of its affiliates, does not exceed 500 persons. For purposes of this statement: (1) the number of employees of the business concern is the average over the previous fiscal year of the concern of the persons employed on a full-time, part-time or temporary basis during each of the pay periods of the fiscal year, and (2) concerns are affiliates of each other when either, directly or indirectly, one concern controls or has the power to control the other, or a third-party or parties controls or has the power to control both.

I hereby declare that rights under contract or law have been conveyed, to and remain with the small business concern identified above with regard to the invention, entitled CASING CENTRALISER, by inventor(s) Im Alexander Kirk, William Barron, and Aferdy Barron Clark described in

- ☐ the specification filed herewith.  
☒ application serial no. PCT/GB98/00554, filed 23 February 1998  
☐ patent no. . . . . issued . . . . .

If the rights held by the above identified small business concern are not exclusive, each individual, concern or organization having rights in the invention is listed below and no rights in the invention are held by any person, other than the inventor, who could not qualify as a small business concern under 37 CFR 1.9(c) or by any concern which would not qualify as a small business concern under 37 CFR 1.9(c) or a nonprofit organization under 37 CFR 1.9(e).

\*NOTE: Separate verified statements are required from each named person, concern or organization having rights in the invention according to their status as small entities. (37 CFR 1.27)

NAME: \_\_\_\_\_

ADDRESS: \_\_\_\_\_

☐ INDIVIDUAL☐ SMALL BUSINESS CONCERN☐ NONPROFIT ORGANIZATION

NAME: \_\_\_\_\_

ADDRESS: \_\_\_\_\_

☐ INDIVIDUAL☐ SMALL BUSINESS CONCERN☐ NONPROFIT ORGANIZATION

I acknowledge the duty to file, in this application or patent, notification of any change in status resulting in loss of entitlement to small entity status prior to paying, or at the time of paying, the earliest of the issue fee or any maintenance fee due after the date on which status as a small business entity is no longer appropriate. (37 CFR 1.28(b)).

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like are made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application, any patent issuing thereon, or any patent to which this verified statement is directed.

NAME OF PERSON SIGNING

William Barron

TITLE OF PERSON OTHER THAN OWNER

DIRECTOR

ADDRESS OF PERSON SIGNING

61 SEAFIELD ROAD, ABERDEEN, U.K.

SIGNATURE

William BarronDATE 23/08/99

1

1 "CASING CENTRALISER"

2

3 The invention relates to a casing centraliser. This  
4 application is a Continuation-In-Part of PCT/GB98/00554  
5 to which filing details have not yet been assigned by  
6 the USPTO.

7

8 Background to the invention.

9 When a well has been drilled for the eventual  
10 production of hydrocarbons, one of the procedures  
11 commonly employed in readying the well for production  
12 comprises installing hollow tubular casing in the well  
13 to line the borehole. The space between the exterior  
14 of the casing and the sides of the borehole are filled  
15 with cement, which acts as a sealant and provides  
16 mechanical support for the casing. As it is desirable  
17 that the casing be centralized in the well bore when  
18 cemented, proposals have been made for providing the  
19 casing (prior to cementing) with externally mounted  
20 centralisers to hold the casing away from the well bore  
21 and towards the centre of the bore.

22

23 Summary of the invention.

1 longitudinally therethrough, the annular body being  
2 formed from at least one material selected from the  
3 group consisting of plastic material, elastomeric  
4 material and rubber material, the substantially  
5 cylindrical bore being a clearance fit around the  
6 tubular casing to be centralised by the centraliser.

7  
8 In a preferred embodiment the invention provides a  
9 casing centraliser assembly comprising tubular casing  
10 and a centraliser as defined above.

11  
12 Typically, the plastic, elastomeric and/or rubber  
13 material may comprise polytetrafluoroethylene (PTFE),  
14 polyetheretherketone, carbon reinforced  
15 polyetheretherketone, polyphthalamide, polyvinylidene  
16 fluoride, polyphenylene sulphide, polyetherimide,  
17 polyethylene, polysulphone, polyethersulphone,  
18 polybutyleneterephthalate, polyetherketoneketone,  
19 polyamides, rubber & rubber compounds, phenolic resins  
20 or compounds, thermosetting plastics, thermoplastic  
21 elastomers, thermoplastic compounds or thermoplastic  
22 polyester resins.

23  
24 In one example of the invention, the plastic,  
25 elastomeric or rubber material may contain a filler  
26 material, such as glass, carbon, PTFE, silicon,  
27 molybdenum disulphide, graphite, oil or wax, or any  
28 combination of these materials.

29  
30 The annular body may be manufactured from and consist  
31 of the plastic, elastomeric and/or rubber material.  
32 However, the annular body may comprise a combination of  
33 the plastic, elastomeric and/or rubber material and  
34 another material such as a metal. For example, the  
35 annular body may comprise a metal skeleton or other

1 structure coated, or partially coated, with the  
2 plastic, elastomeric or rubber material. In addition,  
3 or as an alternative, the annular body may comprise a  
4 combination of different plastic, elastomeric and/or  
5 rubber materials.

6  
7 The annular body may be formed in one or more sections  
8 which may be assembled around the tubular to be  
9 centralised by the centraliser. In one embodiment the  
10 annular body is divided into 2 sections along its axis  
11 so that each section forms a "half shell" arrangement.  
12 The concave surface of one section can be fitted direct  
13 against one side of the outer surface of the tubular  
14 and connected to another section similarly positioned  
15 against the opposite side of the tubular. The 2  
16 sections can then be connected around the tubular to  
17 make up the centraliser so that it does not need to be  
18 offered up to the end of the tubular. This can be very  
19 useful in coil tubing applications.

20  
21 The division between the sections need not be axial.

22  
23 In some embodiments the sections can be hingedly  
24 attached to one another. In others the 2 sections can  
25 be separate. There can be more than 2 sections  
26 provided. It is sufficient that the sections are  
27 adapted to allow the centraliser to be placed around  
28 the tubular without needing to be threaded over an end  
29 of the tubular.

30  
31 The sections are preferably held together by fixings  
32 and/or hinges. Preferred fixings include bolts but  
33 catches and locks can also be used.

34  
35 Preferably the centraliser further comprises a

1 peripheral array of a plurality of longitudinally  
2 extending blades circumferentially distributed around  
3 said body to define a flow path between each  
4 circumferentially adjacent pair of said blades, each  
5 said flow path providing a fluid flow path between  
6 longitudinally opposite ends of said centraliser, each  
7 said blade having a radially outer edge providing a  
8 well bore-contacting surface.

9  
10 Said centraliser is preferably free of any means  
11 tightly gripping a casing when said centraliser is  
12 installed thereon, whereby said centraliser and said  
13 casing are mutually rotatable.

14  
15 Said blades are preferably mutually substantially  
16 equidistantly distributed around said body. Said blades  
17 preferably each extend circumferentially at least  
18 part-way around said body between longitudinally  
19 opposite ends thereof to provide a circumferential  
20 distribution of each said well bore-contacting surface.  
21 Each said blade preferably has a radially inner root  
22 integral with said body, each said radially inner root  
23 preferably being circumferentially wider than the  
24 respective radially outer edge. Said blades are  
25 preferably circumferentially wider at one end of the  
26 centraliser than at the other end, said one end  
27 preferably the lower end of the centraliser in use  
28 thereof. Said centraliser preferably has five of said  
29 blades.

30  
31 Longitudinally opposite ends of said blades and/or of  
32 said body may be chamfered or tapered whereby to  
33 facilitate passage of said centraliser down a well  
34 bore.

35



1 Brief description of the drawings.

2 Examples of a casing centraliser in accordance with the  
3 invention will now be described with reference to the  
4 accompanying drawings, in which:-

5

6 Fig. 1 is a perspective view from above and to one  
7 side of a first example of a casing centraliser;  
8 Fig. 2 is a plan view from above of the first  
9 example;

10 Fig. 3 is an underneath view of the first example;  
11 Figs. 4 and 5 are respectively radial (plan) and  
12 circumferential (side) views of a blade forming  
13 part of the first example;

14 Fig. 6 is a perspective view of a casing  
15 centraliser mounted on casing in a borehole;

16 Fig 7a shows a side view of a second centraliser  
17 on a tubular, Fig 7b shows the same centraliser in  
18 plan view, and Fig 7c shows the same centraliser  
19 in exploded plan view.

20

21 Description of preferred embodiments.

22 Referring first to Figs. 1 to 3, a casing centraliser  
23 10 is a unitary annulus comprising a generally  
24 cylindrical body 12, and an array of five  
25 equiangularly-spaced blades 14 integrally formed with  
26 the body 12. A cylindrical bore 16 extends  
27 longitudinally and coaxially through the body 12, the  
28 bore 16 having a substantially uniform diameter  
29 dimensioned to be a clearance fit around the well bore  
30 casing (not shown in Figs. 1 to 3). Each of the blades  
31 14 (see also Figs. 4 and 5) not only extends between  
32 longitudinally opposite ends of the body 12, but also  
33 extends circumferentially part-way around the periphery  
34 of the centraliser 10. The skewing of the blade 14  
35 ensures that their respective radially outer edges 18

5

1 collectively provide a circumferentially substantially  
2 uniform well bore-contacting surface for the  
3 centraliser 10, as most particularly shown in Figs. 2  
4 and 3.

6 Each of the blades 14 has a respective radially inner  
7 root 20 integral with the body 12. In each of the  
8 blades 14, the root 20 has a greater circumferential  
9 width than the outer edge 18, ie the cross-section of  
10 each blade 14 tapers towards the well bore-contacting  
11 periphery of the centraliser 10. The individual and  
12 collective shapes of the blades 14, and of the  
13 longitudinal fluid flow passages defined between  
14 adjacent pairs of the blades 14, gives the centraliser  
15 10 improved flow characteristics and minimises the  
16 build-up of trapped solids during use of the  
17 centraliser 10.

19      Longitudinally opposite ends of the blades 14, and of  
20      the body 12, are chamfered to assist in movement of the  
21      centraliser 10 up/down a well bore.

23 Although the blades 14 are shown separately from the  
24 body 12 in Figs 4 and 5 (and while the blades 4 could  
25 be separately formed and subsequently attached to the  
26 body 12 by any suitable means) it is preferred that the  
27 entire centraliser 10 is fabricated as a one-piece  
28 article.

30 The centraliser 10 may be manufactured entirely from a  
31 plastics, elastomeric and/or rubber material.  
32 Alternatively, the centraliser may comprise a metal  
33 body coated, or partially coated, with a plastic,  
34 elastomeric and/or rubber material.

35

7

1 Examples of possible plastic, elastomeric and/or rubber  
2 materials are polytetrafluoroethylene (PTFE),  
3 polyetheretherketone, carbon reinforced  
4 polyetheretherketone, polyphthalamide, polyvinylidene  
5 fluoride, polyphenylene sulphide, polyetherimide,  
6 polyethylene, polysulphone, polyethersulphone,  
7 polybutyleneterephthalate, polyetherketoneketone,  
8 polyamides, rubber & rubber compounds, phenolic resins  
9 or compounds, thermosetting plastics, thermoplastic  
10 elastomers, thermoplastic compounds or thermoplastic  
11 polyester resins.

12  
13 The plastics, elastomeric and/or rubber material may  
14 contain a filler. Examples of possible fillers are  
15 glass, carbon, PTFE, silicon, molybdenum disulphide,  
16 graphite, oil or wax, or any combination of these  
17 materials.

18  
19 Use of a plastic, elastomeric and/or rubber material  
20 gives a number of advantages, including:- chemical  
21 resistance, such as resistance to acid; non-sparking  
22 (ie sparks are not generated if the centraliser 10  
23 collides with steel); and, materials such as PTFE give  
24 superior bearing properties.

25  
26 Since the bore 16 is a clearance fit around the casing  
27 and since the bore 16 lacks any means of tightly  
28 gripping a normally dimensioned casing, the centraliser  
29 10 can not only rotate freely around the casing but  
30 also move freely along the casing (unless and until the  
31 centraliser collides with an obstruction, for example a  
32 protruding casing joint). Thus to provide longitudinal  
33 restraint for the centraliser 10 to retain the  
34 centraliser substantially at its preferred location  
35 along the casing but without impairing the relative

1 rotatability of centraliser and casing, use is made of  
2 a stop collar 50, as illustrated in Fig. 6.

3

4 Fig. 6 shows a modified form of casing centraliser 100,  
5 fitted around hollow tubular casing 102 which is  
6 located within a well bore 104. The modified  
7 centraliser 100 is essentially the same as the  
8 centraliser 10 described above, and differs principally  
9 in the dimensions and proportions of its blades 106.  
10 In particular, the blades 106 are circumferentially  
11 wider at the lower end of the centraliser 100 than they  
12 are at the upper end. Fig. 6 also illustrates the  
13 manner in which the centraliser will hold casing out of  
14 direct contact with the well bore and centrally within  
15 the well bore, in preparation for subsequent cementing.

16

17 Fig 7 shows a modified plastic centraliser 110 located  
18 around a length of casing 112. The centraliser 110 has  
19 blades R1, R2, R3 and R4 spaced around its outer  
20 surface to contact the inner surface of the wellbore  
21 and to centralise the casing 112 therein. The blades R  
22 extend axially along the centraliser but can  
23 alternatively extend around the outer circumference of  
24 the centraliser like the blades 106.

25

26 The centraliser 110 is axially divided along the  
27 midline of opposing blades R2 and R4 to form two half  
28 shells 110a and 110b, so that the blades R2 and R4 are  
29 formed only when the opposing faces F of the half  
30 shells 110a and 110b are joined together. Half shell  
31 110a has two threaded sockets S in each of the faces F  
32 of R2 and R4 to receive bolts B protruding through the  
33 faces F of the other half shell 110b. The bolts B  
34 engage in the sockets S and pull the faces F together  
35 when the centraliser 110 is made up around the casing

1 112 and the bolts tightened.

2

3 The centraliser 110 can be formed from  
4 polytetrafluoroethylene (PTFE), polyetheretherketone,  
5 carbon reinforced polyetheretherketone,  
6 polyphthalamide, polyvinylidene fluoride,  
7 polyphenylene sulphide, polyetherimide, polyethylene,  
8 polysulphone, polyethersulphone,  
9 polybutyleneterephthalate, polyetherketoneketone,  
10 polyamides, rubber & rubber compounds, phenolic resins  
11 or compounds, thermosetting plastics, thermoplastic  
12 elastomers, thermoplastic compounds or thermoplastic  
13 polyester resins.

14

15 The centraliser 110 is useful with coil tubing  
16 applications, but may also be used for casing and  
17 screens to afford protection from acids and other  
18 harmful chemicals downhole.

19

20 In the case of casing located within larger diameter  
21 casing, centralisers can be employed on the inner  
22 casing to hold it out of direct contact with the outer  
23 casing.

24

25 Advantages of the invention are that the use of a  
26 plastics, elastomeric and/or rubber material for the  
27 centraliser helps to provide chemical resistance, such  
28 as resistance to corrosion from acid. Other advantages  
29 are that the materials are generally non sparking and  
30 that certain materials, for example PTFE, have superior  
31 bearing properties.

32

10

## 1 Claims:

2 1 A casing centraliser comprising an annular body,  
3 the annular body having a substantially cylindrical  
4 bore extending longitudinally therethrough, the annular  
5 body being formed from at least one material selected  
6 from the group consisting of plastic material,  
7 elastomeric material and rubber material, the  
8 substantially cylindrical bore being a clearance fit  
9 around the tubular casing to be centralised by the  
10 centraliser.

11  
12 2 A casing centraliser as claimed in claim 1 wherein  
13 the material is selected from the group consisting of  
14 polytetrafluoroethylene (PTFE), polyetheretherketone,  
15 carbon reinforced polyetheretherketone,  
16 polyphthalamide, polyvinylidene fluoride,  
17 polyphenylene sulphide, polyetherimide, polyethylene,  
18 polysulphone, polyethersulphone,  
19 polybutyleneterephthalate, polyetherketoneketone,  
20 polyamides, rubber & rubber compounds, phenolic resins  
21 or compounds, thermosetting plastics, thermoplastic  
22 elastomers, thermoplastic compounds and thermoplastic  
23 polyester resins.

24  
25 3 A casing centraliser as claimed in claim 1,  
26 wherein the material contains a filler material.

27  
28 4 A casing centraliser as claimed in claim 3 wherein  
29 the filler material is selected from the group  
30 consisting of glass, carbon, PTFE, silicon, molybdenum  
31 disulphide, graphite, oil and wax.

32  
33 5 A casing centraliser assembly as claimed in claim  
34 1, wherein the annular body is of unitary construction.

35

1 6 A casing centraliser as claimed in claim 1,  
2 wherein the annular body comprises a combination of at  
3 least two different materials.

4  
5 7 A casing centraliser as claimed in claim 1,  
6 wherein the annular body comprises a metal skeleton at  
7 least partially coated with said material.

8  
9 8 A casing centraliser as claimed in claim 1, having  
10 a peripheral array of a plurality of longitudinally  
11 extending blades circumferentially distributed around  
12 the body of the centraliser to define a flow path  
13 between each circumferentially adjacent pair of said  
14 blades, each said flow path providing a fluid flow path  
15 between longitudinally opposite ends of said  
16 centraliser, each said blade having a radially outer  
17 edge providing a well bore-contacting surface.

18  
19 9 A casing centraliser as claimed in claim 8,  
20 wherein the blades are mutually substantially  
21 equidistantly distributed around the body.

22  
23 10 A casing centraliser as claimed in claim 8,  
24 wherein the blades each extend circumferentially at  
25 least part-way around said body between longitudinally  
26 opposite ends thereof to provide a circumferential  
27 distribution of each said well bore-contacting surface.

28  
29 11 A casing centraliser as claimed in claim 8,  
30 wherein each blade has a radially inner root integral  
31 with said body, each said radially inner root  
32 preferably being circumferentially wider than the  
33 respective radially outer edge.

34  
35 12 A casing centraliser as claimed in claim 8,

12

1 wherein the blades are circumferentially wider at a  
2 lower end of the centraliser than at the upper end.

4     13     A casing centraliser as claimed in claim 8,  
5     wherein said centraliser has five of said blades.

14 A casing centraliser as claimed in claim 1,  
substantially free of any means tightly gripping a  
casing when said centraliser is installed thereon,  
whereby said centraliser and said casing are mutually  
rotatable.

13     15     A casing centraliser assembly comprising tubular  
14     casing and a centraliser as claimed in claim 1.

16     16     A casing centraliser as claimed in claim 1,  
17     wherein the annular body is divided along its axis into  
18     at least two inter-connectable sections.

17 A casing centraliser as claimed in claim 16,  
wherein each of said at least two inter-connectable  
sections is adapted to allow the centraliser to be  
placed around the tubular without needing to be  
threaded over an end of the tubular.

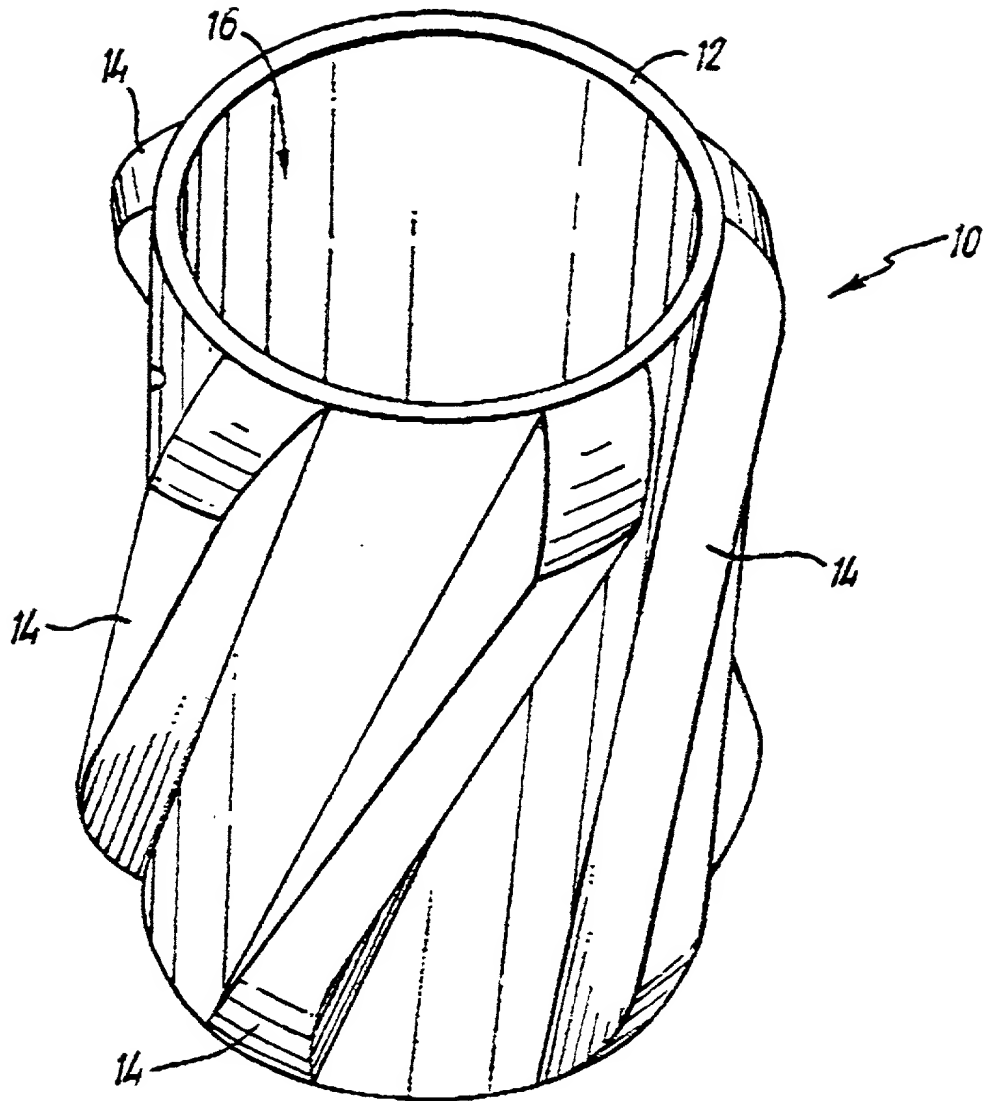
26 18 A casing centraliser as claimed in claim 16,  
27 wherein the division between the sections is not axial.

19 A casing centraliser as claimed in claim 16,  
wherein the sections are hingedly attached to one  
another.

33      20    A casing centraliser as claimed in claim 16,  
34      wherein the sections are held together by fixings.



1/5



FTE.1

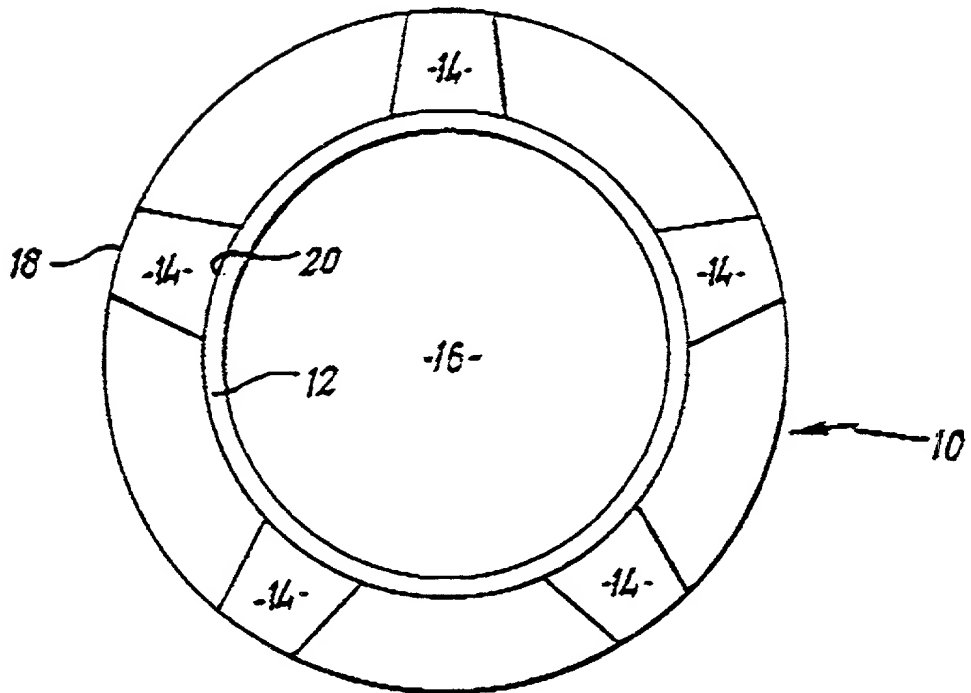
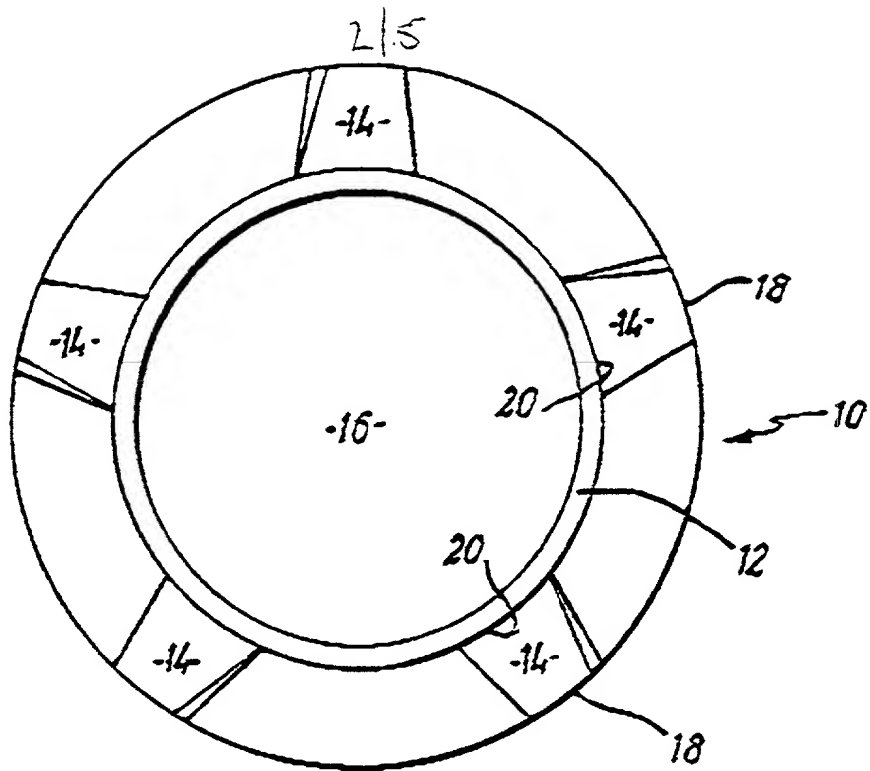






Fig. 7a

5/5

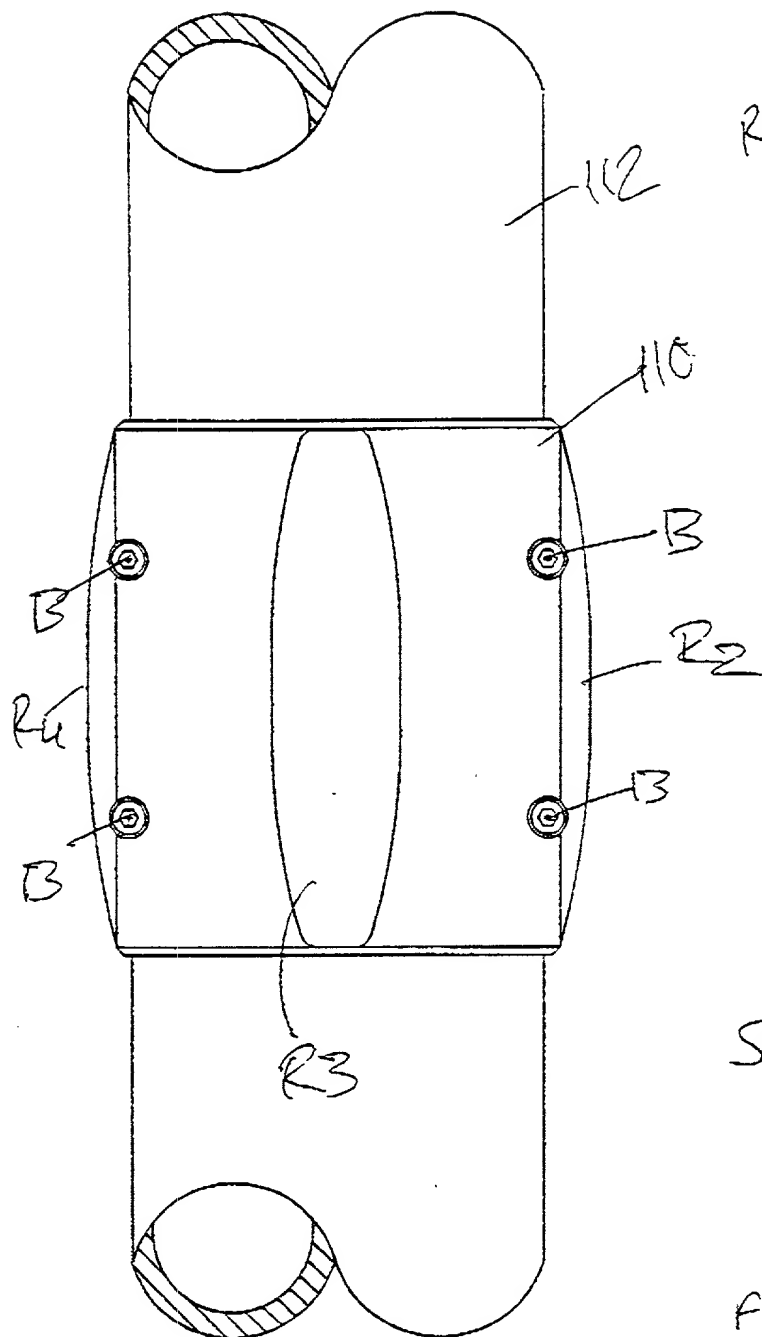


Fig. 7b

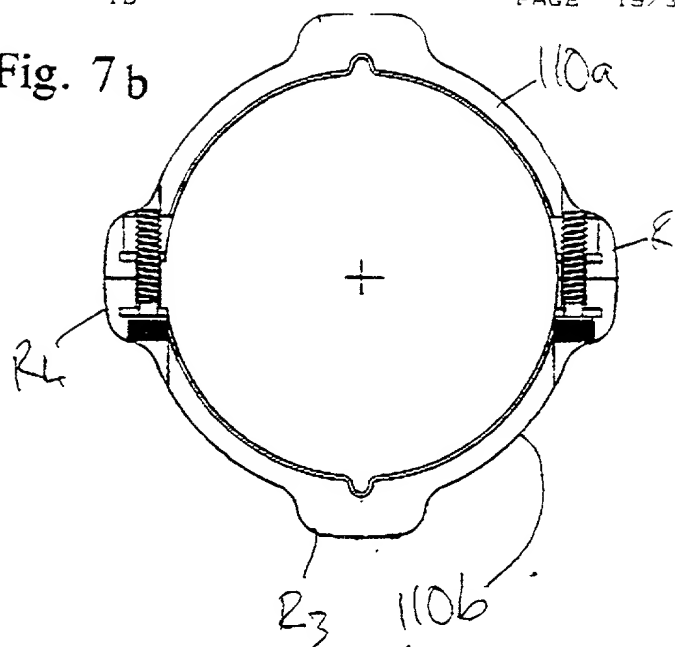
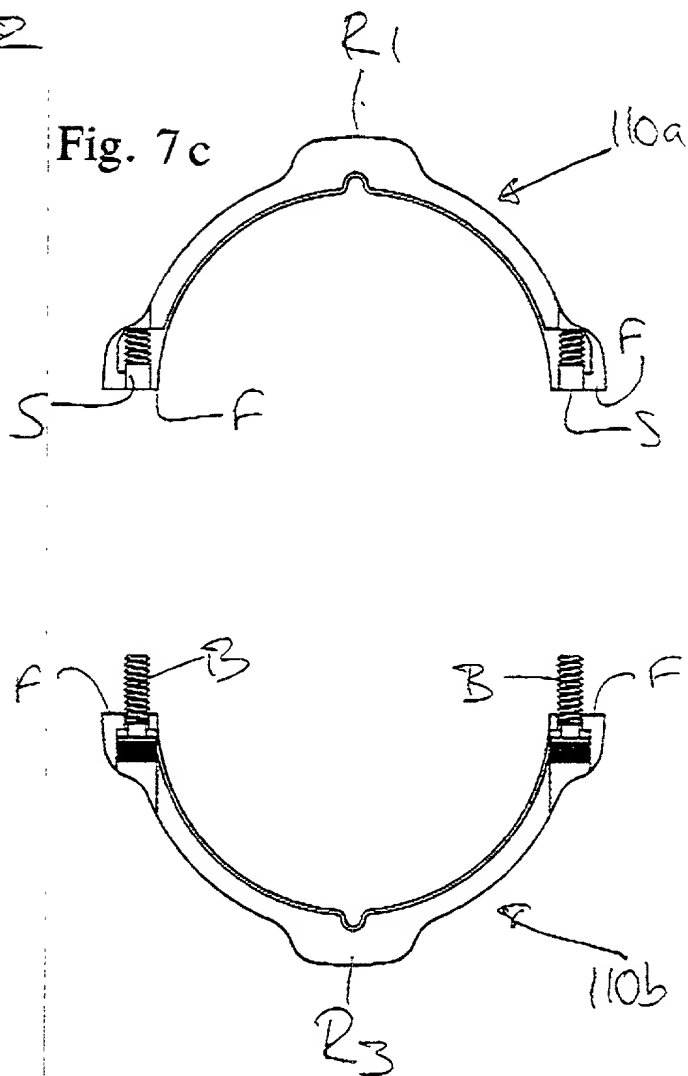


Fig. 7c



# Declaration and Power of Attorney For Patent Application

## English Language Declaration

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name,

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

CASING CENTRALISER,

the specification of which is attached hereto unless the following box is checked:

☐ was filed on 23 February 1998 as  
United States Application Number or PCT International Application Number PCT/GB98/00554  
and was amended on \_\_\_\_\_ (if applicable).

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR § 1.56.

I hereby claim foreign priority benefits under 35 U.S.C. § 119(a)-(d) or § 365(b) of any foreign application(s) for patent or inventor's certificate, or § 365(a) of any PCT International application which designated at least one country other than the United States, listed below and have also identified below by checking the box, any foreign application for patent or inventor's certificate, or PCT International application having a filing date before that of the application on which priority is claimed:

Prior Foreign Application(s)

Priority Not Claimed

9703608.1                      GB                      21 February 1997  
(Number)                      (Country)                      (Day/Month/Year Filed) ☐

\_\_\_\_\_  
(Number)                      (Country)                      (Day/Month/Year Filed) ☐

I hereby claim the benefit under 35 U.S.C. § 119(e) of any United States provisional application(s) listed below.

\_\_\_\_\_  
(Application Number)                      (Filing Date)

\_\_\_\_\_  
(Application Number)                      (Filing Date)

I hereby claim the benefit under 35 U.S.C. § 120 of any United States application(s), or 365(c) of any PCT International application designating the United States, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International application in the manner provided by the first paragraph of 35 U.S.C. § 112, I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR § 1.56 which became available between the filing date of the prior application and the national or PCT international filing date of this application:

UNEXECUTED COPY

(Application Number)

(Filing Date)

(Status - patented, pending, abandoned)

(Application Number)

(Filing Date)

(Status - patented, pending, abandoned)

POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith:

Paul F. Prestia	Reg. No. 23,031	Lawrence E. Ashery	Reg. No. 34,515	Mark J. Marcelli	Reg. No. 36,593
Allan Ratner	Reg. No. 19,717	Christopher R. Lewis	Reg. No. 36,201	Joshua L. Cohen	Reg. No. 38,040
Andrew L. Ney	Reg. No. 20,300	Robert L. Andersen	Reg. No. 25,771	Christopher J. Dervishian	Reg. No. 42,480
Kenneth N. Nigon	Reg. No. 31,549	Daniel N. Calder	Reg. No. 27,424	Jack J. Jankovitz	Reg. No. 42,690
Kevin R. Casey	Reg. No. 32,117	Louis W. Beardell, Jr.	Reg. No. 40,506		
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I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Full name of sole or first inventor (given name, family name) Ian Alastair Kirk

Inventor's signature \_\_\_\_\_ Date \_\_\_\_\_

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Second Inventor's signature \_\_\_\_\_ Date \_\_\_\_\_

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Additional inventors are being named on separately numbered sheets attached hereto.

UNEXECUTED COPY

Full name of third joint inventor, if any (given name, family name) Alistair Bertram Clark

Third inventor's signature \_\_\_\_\_ Date \_\_\_\_\_

Residence Aberdeen, Scotland

Citizenship GB

Post Office Address 7 Westwood Grove, Westhill, Aberdeen AB32 6XF, UNITED KINGDOM

Full name of fourth joint inventor, if any (given name, family name) \_\_\_\_\_

Fourth inventor's signature \_\_\_\_\_ Date \_\_\_\_\_

Residence \_\_\_\_\_

Citizenship \_\_\_\_\_

Post Office Address \_\_\_\_\_

Full name of fifth joint inventor, if any (given name, family name) \_\_\_\_\_

Fifth inventor's signature \_\_\_\_\_ Date \_\_\_\_\_

Residence \_\_\_\_\_

Citizenship \_\_\_\_\_

Post Office Address \_\_\_\_\_

Full name of sixth joint inventor, if any (given name, family name) \_\_\_\_\_

Sixth inventor's signature \_\_\_\_\_ Date \_\_\_\_\_

Residence \_\_\_\_\_

Citizenship \_\_\_\_\_

Post Office Address \_\_\_\_\_

Full name of seventh joint inventor, if any (given name, family name) \_\_\_\_\_

Seventh inventor's signature \_\_\_\_\_ Date \_\_\_\_\_

Residence \_\_\_\_\_

Citizenship \_\_\_\_\_

Post Office Address \_\_\_\_\_

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